e) receiving and decoding said index signal at a receiving station;

f) selecting, at said receiving station, one or more data packets in said information signal based on index information extracted from said index signal;

g) decoding the selected data packets in said information signal at said receiving station.

REMARKS

In response to the Office Action dated 29 November 2000, claims1 and 8 have been amended.

Claim 1 has been amended herein to point out that the broadband signal is a primary data signal, and to explicitly recite that the broadband signal data are not organized in data frames. Claim 1 has additionally been amended to correct clerical errors, substituting "transmitting station" for "transceiver station."

Claim 8 has been amended herein to correct clerical errors, substituting "relay station" for "transmitting station." The errors are of a self-evident nature in light of Applicant's invention as disclosed in the Specification. "The index signals are transmitted over a narrow band beam and the information signals are transmitted over a [broadband] beam from the satellite to a plurality of receivers." Specification, pg. 4, ll. 11-13 (emphasis added).

No new matter has been added. These amendments are made to correct minor clerical errors, and not for any reason related to patentability. It is believed that these amendments place the application in condition for allowance and re-examination of the application is therefore respectfully requested.

Applicant's invention comprises a satellite-based, wide area communication system wherein receiver address and packet start time information is separated from the transmitted data. A narrow band beam carries an index signal (containing addresses and start times). A broadband beam carries the primary information signals (data), which is indexed by the index signal. Applicant's invention thus contemplates the simultaneous transmission of two separate signals to all receivers – one broadband signal containing the data and a separate narrowband signal containing the associated addresses and start times for the data in the broadband signal. Claim 1 (as amended herein) is representative:

> 1. A method of transmitting data in a digital communication system between a transmitting station and a receiving station, said transmitting method comprising:
> a) transmitting a frameless broadband primary data signal from a transmitting station to a plurality of receivers, wherein said primary data signal contains a plurality of information signals intended for specific receivers.
> b) transmitting an index signal from said transmitting station to said plurality of receivers, wherein said index signal contains index information for selecting information signals in said primary data signal;
> c) receiving and decoding said index signal at a receiving station;
> d) selecting, at said receiving station, one or more information signals in said primary data signal based on index information extracted from said index signal;
> e) decoding the selected information signals in said primary data signal at said receiving station.

The prior art made of record does not teach or suggest the separate transmission of index/address in a narrow band signal and information/data in a separate broadband signal. Nor does it teach or suggest that thus configured, the information need not be framed, as for example, in Time Division Multiplexed (TDM) frames.

The Examiner rejected claims 1-20 under 35 U.S.C. § 102(e) as being anticipated by Gilhousen et al. U.S. Patent No. 4,979,170 to Gilhousen et al. (hereinafter, "Gilhousen et al.") discloses a satellite-based wide area communication system wherein receiver address and channel select information is separated from data.

Mobile transceiver cost and complexity is reduced by monitoring only the address channel until a matching address is found, then extracting data from the correspondingly designated channel. All of the information broadcast (*i.e.*, address, channel select, and data) are formatted into channels in a Time Division Multiplexed (TDM) frame. The TDM frame is transmitted over a broad spectrum by Frequency Hopping the carrier frequency. All of the information is transmitted in the same signal.

The Examiner stated, "the index channel information is anticipated by the address channel as shown in Fig. 2." The "address channel" depicted in Fig. 2 of Gilhousen et al. comprises the assembly over time (over a sequence of hops, *i.e.*, sequential frequency hops in the spread spectrum broadcast scheme) of the interleaved transmission of a "channel," or time slot, in a TDM frame. Gilhousen et al. describes the structure and packing of a TDM frame:

> The TDM approach divides the total transmitted (or received) spectrum into temporal increments or frames of predetermined length. Messages or message signals transmitted in or by the communications system 10 are allocated portions of this time controlled sequence known as channels, and no other signal uses the system at exactly the same time. . . . Each frame consists of a number of channels which represent substantially identical, sub-frame length periods during which symbols are transferred.
> Gilhousen et al., col. 8, ll. 22-39, emphasis added.

The "channels" of Gilhousen et al. are completely distinct from the "signals" of Applicant's invention, which are separate electromagnetic transmissions. The division of the TDM frame between address and data information is also described:

> . . . Time Division Multiplexed communications signals which comprise N serial channels, with D data channels (D < N) used for transmission of message data and A address channels (where A=N-D) used for transmission of address information. The address information is in the form of terminal addresses where messages are designed to be sent.
> Gilhousen et al., col. 3, ll. 50-6.

Addresses and data are thus assigned different "channels" or time slots within a TDM frame, and interleaved among many frames. Applicant recognized the TDM approach to reducing receivers' overhead in demodulating and decoding an entire broadband data stream. "One technique that has been utilized previously to address [the] problem is . . . based on time division multiple access (TDMA) and framing at the satellite." Specification, pg. 2, ll. 1-3. However, Applicant explicitly rejected that approach as being inferior to the present invention. "Another approach, known as the point and shoot approach, does not involve time division or data framing at the satellite." Specification, pg. 2, ll. 15-6. "There is no framing as in time division multiple access (TDMA) schemes." Specification, pg. 6, ll. 20-1. Claim 1 has been amended herein to explicitly recite that Applicant's invention does not involve data framing. Thus, Gilhousen et al. teaches away from Applicant's invention, as claimed herein.

In Gilhousen et al., the addresses and data (packed into a temporal series of TDM frames) are subsequently transmitted in the same signal. That signal is frequency hopped over a large spectrum. "[T]he operating frequency of the TDM communications signal is frequency hopped at differing rates between the forwarding and return links . . ." Gilhousen et al., col. 4, ll. 22-6. In stark contrast, Applicant's invention divides address and data information into two distinct signals that are simultaneously transmitted to the receivers. "The index signals [addresses] are transmitted over a narrow band beam and the information signals [data] are transmitted over a [broadband] beam from the satellite to a plurality of receivers." Specification, pg. 4, ll. 11-3. The Examiner's attention is additionally directed to Applicant's Figures 5A and 5B, clearly

depicting two separate transmissions (using single- and multi-carrier beams, respectively), and depicting the relative bandwidths of each.

Similarly, claim 8 is drawn to a method of transmitting data in a digital communications system that explicitly recites transmitting a single information signal from transmitting station to relay station, and transmitting two separate and distinct signals from the relay station -- the original information signal and an index signal. This claim is not anticipated by Gilhousen et al., which discloses a single signal comprising a succession of TDM frames, each TDM frame containing address and data information in separate frame "channels."

Claim 17 recites a transmitting station with both a first transmitting means for transmitting a broadband information signal having a plurality of data packets, and a second transmitting means for transmitting an index signal including addressing information. Gilhousen et al. does not disclose separate transmitting means for transmitting the address and data portions of a communication. Rather, Gilhousen et al. discloses transmitting a single signal comprising a succession a TDM frames, the address and data of each communication being separated into TDM frame time slots.

The Examiner stated, "a receiver as in claim 19 anticipated [sic] by the receiver of Fig. 3." Applicant's receiver, as claimed in claim 19, includes "a first signal processing means for demodulating and decoding a received index signal," and "a second signal processing means for demodulating and decoding a broadband information signal." The Examiner stated that element 72, a signal demodulator, anticipates the first signal processing means of claim 19, and that elements 72 and 80, the same demodulator and a decoder, anticipate the second signal processing means

of claim 19. This is nonsensical. Both the first and a second signal processing means clearly recite, by the plain language of the claim, that each includes both a demodulator and a decoder. The receiver depicted in Fig. 3 of Gilhousen et al. includes one signal path, one signal demodulator, and one decoder. This is because the receiver receives, demodulates, and decodes only one signal. This one signal contains both address and data information for each communication (in separate "channels" of a TDM frame). The receiver of Gilhousen et al. does not anticipate claim 19.

Regarding claims 2 and 11, and the recitation that the index signal is narrow-band, the terms "narrow-band" and "broadband," as applied to electromagnetic transmissions in the communications arts, refer to the frequency domain width, or spectrum, of a signal. The allocation of "channels," or time slots, within the TDM frame of Gilhousen et al. has nothing to do with the frequency spectrum of a signal that transmits a succession of such TDM frames. Regardless of such intra-frame allocation, both address and data information have the same spectral characteristics, as they are part of the same transmitted signal. Applicant's invention transmits address and data information on separate signals – the former a narrow-band signal, and the latter a broadband signal. Gilhousen et al. does not anticipate claims 2 or 11.

All other rejected claims depend from the claims discussed above, and include all limitations of the independent claims. The index signal being transmitted at the same rate as the information signal (claims 3 and 12), the demodulation and decoding of the index signal in real-time (claims 4 and 13), the broadband data being buffered for later processing (claims 5, 14, 18, and 20), identifying a receiver and the corresponding data packets from the index signal (claim 6), and a start time associated with information for

each communication (claim 15), taken together with the limitations of the independent claims, are all novel features that define patentably over the disclosure of Gilhousen et al.

In light of the above explication, prompt allowance of pending claims 1-20 is respectfully requested.

Respectfully submitted,
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